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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/677,574	10/01/2003	Kenneth M. Carson	APLE.P0063	9303
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STATTLER, JOHANSEN, AND ADELI LLP 1875 CENTURY PARK EAST SUITE 1360 CENTURY CITY, CA 90067			HSU, JONI	
			ART UNIT	PAPER NUMBER

2671

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/677,574	Applicant(s) CARSON ET AL.	
	Examiner Joni Hsu	Art Unit 2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) ☒ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) ☐ Notice of Informal Patent Application (PTO-152) |
| 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) ☐ Other: ____ |

DETAILED ACTION

Claim Objections

1. Claims 3 and 7 are objected to because of the following informalities: Claims 3 and 7 recite “cache that is unusable to *unusable to* store” where it should recite “cache that is unusable to store”. Appropriate correction is required.
2. Claim 17 is objected to because of the following informalities: According to MPEP § 608.01(m), each claim ends with a period, and periods may not be used elsewhere in the claims except for abbreviations. Claim 17 is objected to because it has a period the middle of the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by San (US005357604A).

Art Unit: 2671

5. With regard to Claim 1, San describes a method of executing a set of two or more image processing routines on a processor (Mario chip (graphics coprocessor) 2, Figure 1; Col. 6, lines 29-32; *Mario chip permits 3-D related graphics to be performed*, Col. 7, lines 62-68) using a cache (94, Figure 4B), each routine in the set of routines processing a source being a frame of video data (*implementing video games which include manipulating polygons for each frame*, Col. 1, lines 48-52), the method comprising: a) determining the size of a band of the sources of the set of routines, each source being comprised of two or more bands where the size of a band is related to the size of the cache; and b) executing the set of routines in two or more passes, a pass of the set of routines comprising each routine in the set of routines performing a single processing pass where the routine processes a single band of its source to produce output data (*cache RAM 94 is a 512-byte instruction cache...any program loop that can fit into the 512 bytes cache size can run at full speed, one cycle for both fetch and execute...running a loop inside the cache 94 using the PLOT instruction to write the pixel to RAM 6, 8*, Col. 16, lines 16-30; *Mario chip can execute programs which implement algorithms to manipulate the background and foreground of sprites or moving objects*, Col. 19, lines 47-50).

6. With regard to Claim 2, San describes that step a) comprises determining the size of a band of the sources so that all source data processed by and all output data produced by any routine in the set of routines can be stored to the cache during a single processing pass of the routine (*any program loop that can fit into the 512 bytes cache size can run at full speed, one cycle for both fetch and execute*, Col. 16, lines 16-24).

7. Thus, it reasonably appears that San describes or discloses every element of Claims 1 and 2 and therefore anticipates the claims subject.

8. Claims 14-16 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Lin (US006016151A).

9. With regard to Claim 14, Lin describes a method of executing a plurality of routines that are able to be executed on a first processor (80, Figure 3), the method comprising a) determining an initial list of routines identifiers comprised of a plurality of routines identifiers identifying the plurality of routines, each routine identifier in the plurality routine identifiers identifying a corresponding routine in the plurality of routines (flowchart of 3D-graphics processing, Col. 3, lines 29-55; Col. 7, line 51-Col. 8, line 6). Lin describes that routines having to do with texture gradients and the starting vertex and its texture attributes are sent from the host CPU to graphics accelerator (40). These routines are identified by texture attributes such as rhw (Col. 7, line 51-Col. 8, line 6). Therefore, Lin inherently discloses b) identifying a routine in the initial list of routines as a sendable routine able to be processed by a second processor (40) (Col. 3, lines 52-65; Col. 7, line 51-Col. 8, line 6).

10. With regard to Claim 15, Lin describes that when a routine is identified as having to do with texture gradients and the starting vertex and its texture attributes, they are sent from the host CPU (80, Figure 3) to the graphics accelerator (40) and the graphics accelerator processes the routine instead (Col. 7, line 51-Col. 8, line 6; Col. 3, lines 52-65). Therefore, Lin inherently

discloses c) replacing the sendable routine identifier in the initial list of routine identifiers with an “alternative processor” routine identifier that identifies an “alternative processor” routine that sends the sendable routine to the alternative processor for processing and then receives data produced by the sendable routine; d) modifying the initial list of routine identifiers to indicate the replacing of the sendable routine identifier to produce a modified list of routine identifiers; and e) executing the routines identified in the modified list of routine identifiers.

11. With regard to Claim 16, Lin describes that the initial list of routine identifiers comprises a plurality of routine identifiers to produce a particular final effect; and the modified list of routine identifiers comprises a plurality of routine identifiers used to produce the same particular final effect (Col. 7, line 51-Col. 8, line 6; Col. 3, lines 29-65).

12. With regard to Claim 20, Lin describes that the first processor (80, Figure 3) is a central processing unit and the second processor (40) is a graphics processor (Col. 6, lines 54-57).

13. Thus, it reasonably appears that Lin describes or discloses every element of Claims 14-16 and 20 and therefore anticipates the claims subject.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over San (US005357604A) in view of Morein (US006353874B1).

San is relied upon for the teachings as discussed above relative to Claim 1.

However, San does not teach that step a) comprises determining the size of a band using the following equation: $\text{band size} = [(\text{cache size-overhead})/\text{buffer number}]$. However, Morein describes storing video data in a cache (*caching circuit 100 may be implemented as part of a video graphics integrated circuit*, Col. 3, lines 49-51). Morein describes preventing data from overwriting previously retrieved data in the cache prematurely (Col. 5, lines 14-27). Morein also describes that the number of bits included in each entry within the cache corresponds to the

maximum number of cached entries within the cache memory that are accessible at any one time (Col. 6, lines 32-44). Therefore, Morein inherently discloses that step a) comprises determining the size of a band using the following equation: $\text{band size} = [(\text{cache size-overhead})/\text{buffer number}]$, where the cache overhead is memory space in the cache that is unusable to store data (Col. 5, lines 14-27) and the buffer number is the maximum number of buffers simultaneously accessed if the entirety of each source of the set of routines were processed in one processing pass of the set of routines (Col. 6, lines 32-44).

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to modify the device of San so that step a) comprises determining the size of a band using the following equation: $\text{band size} = [(\text{cache size-overhead})/\text{buffer number}]$ as suggested by Morein because Morein suggests that the overhead must be subtracted from the cache size in order to prevent data from overwriting previously retrieved data prematurely (Col. 5, lines 14-27). Morein also suggests that the band size must be divided by the buffer number to ensure that there is enough room for the maximum number of buffers that are accessed to each store data (Col. 6, lines 32-44).

17. Claims 4-6, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over San (US005357604A) in view of Zatz (US006809732B2).

18. With regard to Claim 4, San describes a method of processing a plurality of image processing routines on a processor (2, Figure 1; Col. 6, lines 29-32; Col. 7, lines 62-68) using a cache (94, Figure 4B), each routine in the plurality of routines processing a source being a frame

of video data (Col. 1, lines 48-52), the method comprising: a) determining an initial list of routine identifiers comprised of a plurality of routine identifiers positioned in a specific order, the plurality of routine identifiers identifying the plurality of image processing routines, each routine identifier in the plurality of routine identifiers identifying a corresponding routine in the plurality of routines (Col. 21, lines 66-67; Col. 23, lines 6-14); and d) determining the size of a band of the sources of the set of routines, each source being comprised of two or more bands where the size of a band is related to the size of the cache (Col. 16, lines 16-30; Col. 19, lines 37-50).

However, San does not teach b) grouping two or more routine identifiers and c) modifying the initial list of routine identifiers to indicate the grouping. However, Zatz describes a method of processing a plurality of image processing routines on a processor (graphics processing pipeline 132, Figure 1; Col. 7, lines 11-25), using a cache (program instruction cache 332, Figure 3; Col. 12, lines 47-61), the method comprising: a) determining an initial list of routines comprised of a plurality of routines positioned in a specific order (*sequencer one 317 sequences the one or more codewords by placing each codeword in a field of the dataflow token*, Col. 16, lines 3-5); b) grouping two or more routines of the plurality of routines into a set of routines (*if two program instructions each specify a simple texture operation, codewords derived from each of these program instructions can be combined into one codeword representation for execution*, Col. 9, lines 2-6); c) modifying the initial list of routines to indicate the grouping of the two or more routines to produce a modified list of routines (*multiple separate sets of data can be processed, dataflow tokens output advantageously serve to signal a computation unit to reconfigure itself with codewords from the dataflow token*, Col. 16, lines 42-53).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify the device of San to include b) grouping two or more routine identifiers and c) modifying the initial list of routine identifiers to indicate the grouping as suggested by Zatz because Zatz suggests that this has the advantage of using fewer codewords (Col. 8, line 62-Col. 9, line 6), which inherently reduces the processing time of the operations.

19. With regard to Claim 5, Claim 5 is similar in scope to Claim 1, and therefore is rejected under the same rationale.

20. With regard to Claim 6, Claim 6 is similar in scope to Claim 2, and therefore is rejected under the same rationale.

21. With regard to Claim 10, San describes a method of processing a plurality of routines, the method comprising: a) determining an initial list of routine identifiers comprised of a plurality of routine identifiers identifying the plurality of routines, each routine identifier in the plurality of routine identifiers identifying a corresponding routine in the plurality of routines (Col. 21, lines 66-67; Col. 23, lines 6-14).

However, San does not teach b) identifying a set of two or more routine identifiers in the initial list of routine identifiers that identify a set of two or more routines that are combinable into a single routine, the single routine being capable of performing each routine in the set of routines; and c) determining a single routine identifier that identifies the single routine.

However, Zatz describes b) identifying a set of two or more routine identifiers in the initial list of

routine identifiers that identify a set of two or more routines that are combinable into a single routine, the single routine being capable of performing each routine in the set of routines; and c) determining a single routine identifier that identifies the single routine (Col. 8, line 62-Col. 9, line 6). This would be obvious for the same reasons given in the rejection for Claim 4.

22. With regard to Claim 11, San does not teach d) replacing the set of routine identifiers in the initial list of routine identifiers with the single routine identifier to produce a modified list of routine identifiers; and e) executing the routines identified in the modified list of routine identifiers. However, Zatz describes d) replacing the set of routine identifiers in the initial list of routine identifiers with the single routine identifier to produce a modified list of routine identifiers; and e) executing the routines identified in the modified list of routine identifiers (Col. 8, line 62-Col. 9, line 6; Col. 16, lines 42-64). This would be obvious for the same reasons given in the rejection for Claim 4.

23. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over San (US005357604A) and Zatz (US006809732B2) in view of Morein (US006353874B1).

Claim 7 is similar in scope to Claim 3, and therefore is rejected under the same rationale.

24. Claims 8, 9, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over San (US005357604A) and Zatz (US006809732B2) in view of Whaley (US006088701A).

25. With regard to Claim 8, San and Zatz are relied upon for the teachings as discussed above relative to Claim 4.

However, San and Zatz do not teach re-ordering a position of a particular routine identifier in the initial list of routine identifiers. However, Whaley describes a method of processing a plurality of image processing routines, wherein step b) further comprises re-ordering a position of a particular routine in the initial list of routines to produce the set of routine; and step c) further comprises modifying the initial list of routines to indicate the re-ordering of the particular routine to produce the modified list of routines (*reorders write instructions, allows the graphics processor to evaluate the data sent to it by software running on the CPU in its intended and proper order, even if the CPU transmits the data to the graphics processor in an order different from that generated by the software, identifies the number of "holes" in the reordered write instructions and when the number of holes becomes zero a set of received data is made available for execution by the graphics processor*, Col. 5, lines 29-44).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to modify the devices of San and Zatz to include re-ordering a position of a particular routine identifier in the initial list of routine identifiers as suggested by Whaley because Whaley suggests that by rearranging the order of the routines, the CPU can optimize performance by issuing the routines such that they will occur in the least amount of time (Col. 3, lines 35-38).

26. With regard to Claim 9, San and Zatz do not teach that the initial list of routine identifiers comprises a plurality of routine identifiers used to produce a particular final effect; and the modified list of routine identifiers comprises a plurality of routine identifiers used to produce the

same particular final effect. However, Whaley describes that the initial list of routine identifiers comprises a plurality of routine identifiers used to produce a particular final effect; and the modified list of routine identifiers comprises a plurality of routine identifiers used to produce the same particular final effect (Col. 3, lines 35-38). This would be obvious for the same reasons given in the rejection for Claim 8.

27. With regard to Claim 12, Claim 12 is similar in scope to Claim 9, and therefore is rejected under the same rationale.

28. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over San (US005357604A) and Zatz (US006809732B2) in view of Dawson (US004876651A).

San and Zatz are relied upon for the teachings as discussed above relative to Claim 10. Zatz describes combining two or more routine identifiers into a single routine identifier, as discussed in the rejection for Claim 10.

However, San and Zatz do not teach identifying routines using a look-up table. However, Dawson describes identifying routines using a look-up table (Col. 15, lines 35-39).

It would have been obvious to one of ordinary skill in this art at the time of invention by applicant to modify the devices of San and Zatz to include identifying routines using a look-up table as suggested by Dawson. Look-up tables increase processing speed. Look-up tables are well-known in the art, widely used, and can be found in many publications, such as the Wikipedia Encyclopedia.

29. Claims 17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (US006016151A) in view of Zatz (US006809732B2).

30. With regard to Claim 17, Claim 17 is similar to Claim 15, except that Claim 17 is for grouping the routine identifiers into a set of routine identifiers. Zatz describes a method of processing a plurality of image processing routines on a processor (132, Figure 1; Col. 7, lines 11-25), using a cache (332, Figure 3; Col. 12, lines 47-61), the method comprising: a) determining an initial list of routines comprised of a plurality of routines positioned in a specific order (Col. 16, lines 3-5); b) grouping two or more routines of the plurality of routines into a set of routines (Col. 8, line 62-Col. 9, line 6); c) modifying the initial list of routines to indicate the grouping of the two or more routines to produce a modified list of routines (Col. 16, lines 42-53). This would be obvious for the same reasons given in the rejection for Claim 4.

31. With regard to Claim 19, Claim 19 is similar in scope to Claim 16, and therefore is rejected under the same rationale.

32. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (US006016151A) and Zatz (US006809732B2) in view of Whaley (US006088701A).

Lin and Zatz are relied upon for the teachings as discussed above relative to Claim 17. Lin describes sendable routine identifiers, as discussed in the rejection for Claim 14. Zatz describes the set of routines, as discussed in the rejection for Claim 17.

However, Lin and Zatz do not teach re-ordering a position of a particular routine identifier in the initial list of routines identifiers. However, Whaley describes a method of processing a plurality of image processing routines, wherein step c) further comprises re-ordering a position of a particular routine in the initial list of routines to produce the set of routines; and step e) further comprises modifying the initial list of routines to indicate the re-ordering of the particular routine to produce the modified list of routines (Col. 5, lines 29-44). This would be obvious for the same reasons given in the rejection for Claim 8.

Prior Art of Record

“Lookup table,” http://en.wikipedia.org/wiki/Lookup_table.

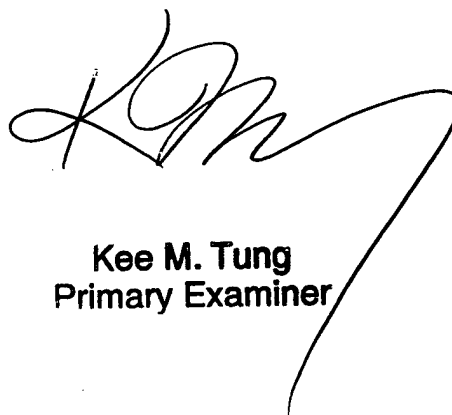
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joni Hsu whose telephone number is 571-272-7785. The examiner can normally be reached on M-F 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JH



Kee M. Tung
Primary Examiner